

waste and the nature of the resultant forms of surface. The wind plays a not unimportant part in modifying the scenery partly by transporting vast clouds of sand away from the mountains and forming sand-hills in the plains, partly by felling large quantities of timber which obstruct the flow of surface-water, dam up streams, and render the country for wide distances all but impenetrable. The action of vegetation in preserving the surface of loose soil from disintegration, and in giving rise to mould, turf, and other accumulations is illustrated by examples met with on the journey. The author enters with considerable minuteness into the dynamics of the Yellowstone geyser region. He carefully describes eighteen groups of thermal springs, and distinguishes these somewhat arbitrarily, as he admits, from the geysers or eruptive springs, of which he enumerates twenty-five. In two concluding chapters he gives some account of the archaeology of the region and of the manners and customs of the Eastern Shoshone Indians, from jottings made by him in intervals of leisure during the march. The Report is illustrated by forty-nine small sketch-maps of each day's march, two large general maps of the region traversed (one coloured geologically), and numerous sketches and sections. As a record of three months of daily toil in a wild little-known region the volume is creditable to its authors, and as a source of information regarding one of the most interesting regions of North America it will be useful to geological and general readers.

ARCH. GEIKIE

NOTES

THE programme of the fifty-first meeting of the German Naturalists and Physicians (the German equivalent of the British Association) will be held this year at Cassel, from September 18 to 24. This, probably the most thoroughly scientific and efficient of all the Associations, consists of twenty-five sections, ranging from Mathematics and Astronomy to Veterinary Surgery. This year a number of addresses on leading topics by eminent men of science are promised. Among these are the following:—"On the Relation of Darwinism to Social Democracy," by Prof. Oscar Schmidt, of Strassburg; "On Symbiosis, Parasitism, and Allied Phenomena of Life," by Prof. De Bary, of Strassburg; "On the Education of the Physician," by Prof. Fick, of Würzburg; "On the Physician in his Relation to Research and Natural Science," by Prof. Hütter, of Greifswald; "On Harvey's Life and Work," by Dr. Baas, of Worms; "On the Colour-sense and Colour-blindness," by Dr. J. Stilling, of Cassel. Many other attractions are promised, including excursions, social gatherings, and the inevitable winding-up "Abschieds-Commerz." The various German railways will afford great privileges to those attending the meeting.

WE have received a circular issued by the local committee of the American Association, which meets at St. Louis on August 21, giving detailed directions as to how to reach the place of meeting from different points. From this circular we learn that the railway companies, proprietors of Pullman and other luxurious cars, various express companies, and the local hotel-keepers, afford unusual facilities to members at greatly reduced rates. The concluding excursion of the meeting is to be to the Rocky Mountain region of Colorado, the details of which have not yet, however, been arranged.

THE thirty-fifth annual congress of the British Archaeological Association will be held at Wisbeach, from August 19 to 27, under the presidency of Lord Hardwicke.

WE are sure that all our readers will be pleased to hear that a Civil List Pension of 200*l.* per annum has been granted to Dr. Prescott Joule.

THE Royal Society of Sciences at Upsala have shown their appreciation of Mr. Alex. Buchan's work as a meteorologist by electing him a foreign member of their body.

MR. P. S. ABRAHAM, M.A., B.Sc., of St. Bartholomew's Hospital, who recently catalogued the Nudibranchiate Mollusca at the British Museum, has been engaged to arrange scientifically, and to write a descriptive catalogue of the natural history collections at the Winchester Town Museum.

LAST week we spoke of the generosity of the United States Government in the distribution of the publication of their admirable surveys. We regret to see, from a speech in the House of Representatives by the Hon. O. R. Singleton, that the usefulness of Dr. Hayden's surveys threatens to be seriously crippled from want of funds. The appropriation for this survey in 1867 was only 5,000 dollars, which in 1873 had been raised to 95,000 dollars. In 1876, however, this was reduced by 30,000 dollars, and again, in 1877, by 20,000, leaving the appropriation at only 45,000 dollars. The largest sum is what is actually needed that the survey may be carried on with efficiency, and to reduce it is quite unworthy of a nation so advanced and liberal as the United States, and is really the worst possible economy. The additions which have been made to science by Dr. Hayden's survey have been immense and of the highest importance, and its economic value to the country can be no less great. The mere list of the many admirable publications of the survey is sufficient to prove that the money has been well spent; and we trust the United States Government and Congress will be able to rise above all party feeling, and prove to the world that they have the best interests of the country and the interests of scientific knowledge at heart by restoring the appropriation to at least its old amount. Mr. Singleton truly says not a small item in favour of these surveys is the check they place on mining and land swindles.

WE have received the first number of the *American Journal of Mathematics*, to which we have already referred on more than one occasion. It is a large quarto of 104 pages, the chief editor being Prof. Sylvester. Its contents will bear comparison with those of any similar publication on this side of the water. We can only give a list of the papers in this number: "Note on a Class of Transformations which Surfaces may undergo in Space of more than Three Dimensions," by Prof. Simon Newcomb; "Researches in the Lunar Theory," by G. W. Hill; "The Theorem of Three Moments," by Dr. H. T. Eddy; "Solution of the Irreducible Case," by Guido Weichold, of Zittau, Saxony; "Desiderata and Suggestions," by Prof. Cayley—"No. 1. The Theory of Groups;" "Note on the Theory of Electric Absorption," by H. A. Rowland; a review, by Mr. C. S. Peirce, of Lieut.-Col. Ferrero's "Espozione del Metodo dei Minimi Quadrati;" "On an Application of the New Atomic Theory to the Graphical Representation of the Invariants and Covariants of Binary Quantics," by Prof. Sylvester. The first announcement of Prof. Sylvester's remarkable application of the chemical theory was made in *NATURE* (vol. xvii. p. 284). The London publishers of the journal are Trübner and Co.

ON the 21st will be opened the new magnetic observatory at Pavlovsk in connection with the Central Physical Observatory of St. Petersburg. The new observatory covers about eight hectares of surface, and the situation is in all respects favourable. The establishment comprises three principal scientific buildings, the main building of stone and surmounted by a tower for meteorological observations; a double-arched structure in stone covered with earth for observations in magnetic variation; and a wooden pavilion, without a particle of iron, for absolute magnetic measurements and for determinations of time. Besides these three buildings devoted to the purely scientific work of the

observatory, there are four wooden houses for lodging the staff, servants, and for other purposes. All these structures are roofed with bituminized paper, and we need scarcely say that the scientific buildings are at a sufficient distance from the other buildings to prevent the scientific observations being affected by their neighbourhood. The Pavlovsk Observatory is furnished with the most improved scientific instruments, and like the Central Physical Observatory of St. Petersburg, is a model establishment of its kind. Every precaution has been taken, both during the building and after its completion, to prevent a trace of iron getting near it. The instruments themselves have been put in their places under the personal superintendence of Dr. Wild, the head of the Central Observatory at St. Petersburg. Provisionally the work of the establishment at Pavlovsk will be specially directed to the observation of the meteorological elements and of terrestrial magnetism. As soon as trustworthy methods have been found for the constant measurements of other elements, such as atmospheric electricity, terrestrial currents, radiation of heat, the optics and chemistry of the sun and sky, these elements will also form the objects of normal observations.

MR. MURRAY has the following books in the press:—"Researches and Adventures among the Lakes and Mountains of Eastern Africa," from the journals of the late Capt. F. Elton, H.B.M.'s Consul in Mozambique; this work will include notes on the suppression of the slave trade, and will be edited, with additions, by the author's companion, H. B. Cotterill; "Sketches of the Natives of Burmah," an account of their manners, customs, and religion, by Capt. C. J. F. S. Forbes, the officiating Deputy Commissioner of British Burmah; the fifth division of Dr. Percy's "Metallurgy," which will treat of silver; and a third revised edition of Mr. E. B. Tylor's "Researches into the Early History of Mankind." Mr. Murray will also publish in autumn the life of another Scottish naturalist, by Dr. Smiles. This newly discovered prodigy, a baker, whose name was Dick, has been dead ten years, and is said to have been an even more remarkable man than Thomas Edward. The principal sphere of his geological and botanical labours was in the region of the Pentland Firth and Dunnet Bay, on the north-west of Scotland.

THE problem of technical education, of which so much has been said of late, has long occupied the attention of thoughtful men in France and Germany. In the former of these countries the question has received much more attention than in the years preceding the war of 1870. In a recent conference at the Trocadéro Palace, M. Corbon, who has laboured in this direction for forty years, urged the introduction of manual employments and of the practical teaching of the skilled industries into the higher schools. He spoke of the good results which had been found to follow the establishment of the municipal School of Apprenticeship in Paris. Although founded only a few years ago, their system of teaching has attained a high degree of development; the mechanical trades being particularly well taught and the pupils of the school being in great demand by masters. Examples of the work of pupils of this excellent institution are shown at the Paris Exhibition in the building known as the "Ville de Paris." Visitors to Paris interested in scientific and technical education should not fail to note the collection of objects there shown. They would also find the school well worthy of a visit. It is situated at No. 60, Boulevard de la Villette.

IT is stated that the Jablochhoff electric lights now so brilliantly employed in the Avenue de l'Opera of Paris are costing 20*l.* per night, but the four-and-thirty lamps that illuminate that street give much more light than is necessary for the purposes of street-lighting. The problem of electric lighting is evidently one

in which the scientific workers across the channel are deeply interested. It is stated that no less than eighteen different kinds of regulators for the electric light are exhibited at the Paris exposition; not including the "candle" of M. Paul Jablochhoff.

M. MAUMENÉ recently communicated to the Société de Physique, of Paris, a discovery of some importance in thermochemistry. Concentrated sulphuric acid which has been left for some months undergoes a change of condition of a singular nature. On mixing a liquid such as olive oil, with, say, one-tenth of its weight of fresh concentrated acid, a certain constant rise of temperature is observed, but if acid three months old is used, the rise of temperature so obtained has a value of about 8° C. less. The same results occur even if the acid has been hermetically sealed in glass tubes. With water and other liquids analogous results are found. It is evident that some of the most important data of the thermal effects of chemical action may require revising in the light of this discovery.

THOUGH it is very difficult to obtain any details about their jealously-guarded country, a Japan contemporary gathers that the condition of the Coreans is just now miserable in the extreme. The spring crops of this year, it is said, will utterly fail, and the stock of food in the country is reported to be a mere nothing for the four or five millions of people, who must, if they can, struggle on in the hope of a possible autumnal harvest. The cause of the Corean famines is not known, but it is probable that the primary cause there, as in China, is disafforestation, for, although the forests of pines, oaks, &c., on the sea-board are carefully preserved, a great drain must have thinned the woods by the river-sides. Much or most of the wood used in Peking for building houses, temples, and palaces is said to come from Corea, and from the same source are obtained the vast supplies needed for Tientsin and the cities of the province of Chihli, which lie on the Pei-ho, Peitang-ho, and the Grand Canal. Corea produces various woods of the finest quality, and the cart shafts, dray poles, and axle-trees in Northern China are made out of the tough and strong Corean ash, elm, hornbeam, and other hard timber. We think, however, that our contemporary is in error in stating, without qualification, that "the great wooden masts which support the noble temples and gatehouses of the Imperial city of Peking (all enormous, beautiful, and enduring spars) come from Corea," for there is no doubt that most of the magnificent wooden pillars to be found in the halls of the Ming tombs and the Peking palaces and temples came from the Chaotung department and other parts of the Yünnan province. The timber in question is called by the Chinese *nan-mu*, and is to be seen in the places mentioned at the present day in perfect condition after the lapse of nearly three hundred years. It may not be uninteresting to add that it is not teak, as is often supposed by foreigners, and that the tree is tall, thin, straight-growing, having no bough or twigs on the stem, but suddenly shooting out branches at the top somewhat like a canopy over a maypole, and its bark is of a peculiar ashy grey colour. This is the account given of it by Mr. Consul Davenport in his Report on the trade capabilities of the country traversed by the Yünnan Mission in 1875-76, who also observed in the Manwyne valley, in the Kakhyn hills, and again in Lower Burmah, in places comparatively accessible, many trees bearing so striking a resemblance to the valuable *nan-mu* that the Indian Government have been recently instituting inquiries into the subject with a view to the development of the timber trade in British Burmah.

WE have received the first part of a new "Anatomisch-physiologischen Atlas der Botanik," by Dr. Arnold Dodel-Port, of Zurich, and his wife, published by Schreiber, of Esslingen. The atlas will be published in two forms containing forty-two and sixty plates respectively, to suit different classes of schools. It

is the finest publication of the kind we have seen, and the plates are of such a size that they may be hung up on the wall. The plants and various parts of plants in the part sent us are magnified from 15 to 8,000 times, and are most beautifully and successfully coloured according to nature. Explanatory text accompanies each plate, and as an aid to botanical teaching it would be difficult to imagine anything more useful and attractive; it would be a boon to teachers and students of botany to have the Atlas published in this country.

THE Harvard Library *Bulletin* No. 8, the *Nation* states, announces that a sufficient subscription to Scudder's "Catalogue of Scientific Serials" has been secured, and that the work will be immediately put to press.

THE eleventh annual report of the Peabody Institute of Baltimore shows that the institution is efficiently serving the various scientific, literary, and artistic purposes for which it was established.

LAST Friday, at half-past 8 P.M., a magnificent meteor was seen at Privat, in the Ardèche Department. The meteor broke into several pieces and emitted a magnificent blue light.

THE state of the weather in the principal Algerian towns is posted regularly at the Meteorological Pavilion in the Trocadero, Paris. A special column is devoted to describing the state of the sea, but the writers having the care of translating the telegrams are so ignorant that they have posted a notice for several days telling the Parisians that "the sea was very smooth at Laghouat and Biskra," two Saharan cities!

THE French *Journal Officiel* has published a notice intimating that a school for telegraphy has been established, and that the course of instruction will be opened in October next. Pupils will be admitted after a competition. Preliminary examinations will take place in several cities of France, and the final examination will take place in Paris. A certain number of places is reserved to the pupils of the Polytechnic School, without competition, though it is expected that this privilege will be cancelled by the Chamber of Deputies when deliberating upon the matter next session.

THE inflation of the great Giffard balloon was completed on Sunday evening. Aeronauts are now busy arranging the manoeuvres, and it is expected that the preliminary ascents will be made at the end of this week. Next week M. Tissandier will make a communication to the Academy of Sciences on behalf of M. Giffard, who has appointed him general manager. MM. Eugene and Jules Godard and Camille Dartois have been appointed aeronauts. Free ascents will be made twice a week from the Cour des Tuileries. The reappearance of a monster captive balloon will very likely revive an interest in aeronautics. We have heard of many contemplated experiments on a smaller scale. Some Americans have constructed, with light oiled silk, a cylinder six feet in height and twenty feet long, which has been filled with pure hydrogen. This elongated balloon supports an immense sheet in silk, on which advertisements are to be painted and exhibited at fixed rates per hour. The effect is said to be very graceful indeed.

IT is stated, on the authority of the *Agricultural Gazette* of Hanover, that a discovery has recently been made of a new remedy for the prevention of ravages to cabbages by the common caterpillar. A steward of an estate in Hanover having observed that one bed of cabbages was left untouched by caterpillars, whilst others were infested with them, found that the healthy bed had a quantity of dill growing on it, the smell of which, apparently, was obnoxious to the caterpillars. As dill will grow in almost any soil, it is suggested that the experiment might be tried by agriculturists. As indicative of the possibility of there being some truth in this, *The Colonies and India* says:—"We have heard of the common

green ("gooseberry") caterpillar being kept off by planting broad beans close to the bushes—and the pyrethrum, a strong smelling weed which is cultivated as a garden border flower—is said to protect vines from the ravages of the *Phylloxera*.

THE phenomenon of supersaturated solutions of salts forms the subject of an elaborate study by M. D. Gernez (*Ann. de l'École normale*, 1878). He finds that besides water a number of other liquids, such as carbon-disulphide, the hydro-carbons, the phenols, and notably the alcohols, afford instances of this peculiarity. A substance which does not yield supersaturated solutions with one solvent never yields them with another, nor can the phenomenon be produced by the addition of substances such as dextrin, tending to increase the viscosity of the solvent. The salts yielding these solutions most easily are sodium carbonate, calcium nitrate, magnesium sulphate, plumbic acetate, and alum. In the case of all five crystallisation ensues only on the introduction of crystals of an isomorphous substance, and the latter lose this property if once heated above a certain temperature, for example, 98° for alum. The author gives a list of 120 substances which possess the property of yielding these solutions.

THE Ethnographic Congress in connection with the Paris Exhibition was opened on Monday. The President, M. Leon de Rosny, delivered a somewhat vague and apparently not over scientific address, in which he defined ethnography as the study of conscious humanity, the discovery of the law of the evolution of humanity in its relation with the general laws of the universe. While anthropology studied individuals or grouped them only according to physical affinities, ethnography recognised groups formed by collective consent and based on compatibilities of temperament and intelligence. It was the fashion, indeed, to decry half-breeds; but the majority, if not the whole, of nations prominent in history had been mixed races, and this mixture was the law of nature, though, under unfavourable conditions, it sometimes proved a failure.

THE report of the Miners' Association of Cornwall and Devon for the year 1877 is, we are glad to say, as satisfactory as usual.

MR. E. SCHÖNE, of Moscow, who is making extended researches on the presence of peroxide of hydrogen in the air, communicates recently the results of his investigations on its presence in the solid and liquid depositions from the atmosphere. He finds that in general the percentage of peroxide of hydrogen increases with the height above the earth's surface at which the condensation of the aqueous vapour takes place. Thus rain always contains more than snow—the rain-clouds moving, as is well known, at a higher elevation than those yielding snow—mists which take their origin near the earth's surface contain comparatively little, and dew and frost show no traces.

THE additions to the Zoological Society's Gardens during the past week include a Beatrix Antelope (*Oryx beatrix*) from Tyef Hedgar, presented by Commander Burke, s.s. *Arctot*, two Crested Porcupines (*Hystrix cristata*), a Banded Ichneumon (*Herpestes fasciatus*) from East Africa, presented by Dr. G. P. Badger; four Paradise Whydah Birds (*Vidua paradisica*), a pintailed Whydah Bird (*Vidua principalis*), three Grenadier Weaver Birds (*Euplectes oryx*) from East Africa, presented by Mr. Archibald Brown; a Barn Owl (*Strix flammea*) from Mesopotamia, presented by Commander Wyatt, s.s. *Deccan*; a Hawk's-billed Turtle (*Chelone imbricata*) from the East Indies, presented by Capt. Henderson; a Water Chevrotain (*Hyomyschus aquaticus*), an Electric Silurus (*Malapterurus beninensis*) from West Africa, a Plantain Squirrel (*Sciurus plantani*) from Java, purchased; a Chimpanzee (*Troglodytes niger*) from West Africa, four Vulturine Guinea Fowls (*Numida vulturina*) from East Africa, deposited; a Hairy Tree Porcupine (*Sphingurus villosus*) born in the Gardens.